SIEMENS

Polymobil III

SP

Maintenance Instructions

System

Polymobil III

The protocol RXB8-115.105.03.04.02 is required for these instructions

© Siemens AG 2005
The reproduction, transmission or use of this document or its contents is not permitted without express written authority. Offenders will be liable for damages. All rights, including rights created by patent grant or registration of a utility model or design, are reserved.

Print No.: RXB8-115.101.03.04.02
Replaces: RXB8-115.101.03.03.02

English
Doc. Gen. Date: 04.05

Document revision level

The document corresponds to the version/revision level effective at the time of system delivery. Revisions to hardcopy documentation are not automatically distributed.

Please contact your local Siemens office to order current revision levels.

Disclaimer

The installation and service of equipment described herein is to be performed by qualified personnel who are employed by Siemens or one of its affiliates or who are otherwise authorized by Siemens or one of its affiliates to provide such services.

Assemblers and other persons who are not employed by or otherwise directly affiliated with or authorized by Siemens or one of its affiliates are directed to contact one of the local offices of Siemens or one of its affiliates before attempting installation or service procedures.

Table of Contents

1 General information 4

Required documents . . . 4
Required tools and measurement devices . . . 5
Required lubricant . . . 6
Emphasized text . . . 7
Safety information and protective measures . . . 8
Abbreviations . . . 10
Protective conductor resistance test information . . . 11
Leakage current measurement information . . . 13
Technical Safety Checks (TSC) . . . 17

2 Inspection and Maintenance 21

Check screws . . . 21
Check handles . . . 22
Checking the wheels . . . 23
Checking the pedal positions . . . 24
Stand . . . 25
Single tank . . . 27
Double-slot diaphragm . . . 28
Visual inspection . . . 29
Check the system for damage . . . 29
Signs . . . 30
Customer documentation . . . 30
Checking the voltage supplies . . . 31
Board D920 . . . 31
Board D910 . . . 31
Radiation . . . 32
Control console . . . 36
Protective conductor test . . . 37
Leakage current measurement . . . 38
Final work steps . . . 39

3 Changes to Previous Version 40

1 General information

1.1 Required documents

• Maintenance protocol	RXB8-115.105.03....
• Service instructions	RXB8-115.061.....
• Operator manual	RXB8-115.201.01...
• Wiring diagram	X038I
• Technical safety checks *	SP00-000.834.01...

* Within the purview of DIN VDE 0751-1, we recommend documenting the results of the maintenance both in the maintenance protocol and in the TSC protocol. The protocols should be filled out completely and handed over to the client after maintenance is complete.

1.2 Required tools and measurement devices

NOTE

All tools, measuring equipment and aids, with the exception of those marked with "*", are listed and specified in the STC (Service Tools Catalog).

- Standard service tool kit *
- Digital multimeter
- 2-channel storage oscilloscope
- Protective conductor meter
- Device leakage current measuring device

1.3 Required lubricant

• Multi-purpose WD-40 spray		28 70 061
• Optimol Longtime PD2 grease	(20 g)	34 91 271 or
	(1 kg)	73 95 445

1.4 Emphasized text

⚠DANGER	**DANGER indicates when there is an immediate danger that l e a d s to death or serious physical injury.**
⚠WARNING	**WARNING indicates a risk of danger that m a y l e a d to death or serious physical injury.**
⚠ CAUTION	**CAUTION used with the safety alert symbol indicates a risk of danger that leads to slight or moderate physical injury and/ or damage to property.**
NOTICE	**NOTICE used without the safety alert symbol indicates a risk of danger that if disregarded leads or may lead to a potential situation which may result in an undesirable result or state other than death, physical injury or property damage.**

Fig. 1: Safety Notes

1.5 Safety information and protective measures

⚠WARNING

Danger of injuries, death or material damage.

Non-compliance can lead to death, injuries or material damage.

Please note:

- **The product-specific safety notes in these instructions,**
- **The general safety information in TD00-000.860.01... and**
- **The safety information according to ARTD part 2.**

⚠WARNING

X-ray radiation!

Non-compliance can lead to illnesses, irreversible damage to body cells and the genotype, severe injuries and even death.

During work on the system in which radiation must be released, the radiation protection directives and the rules for radiation protection according to ARTD 002.731.02... must be complied with.

Please note:

- **Use available radiation protection devices.**
- **Wear radiation protection clothing (lead apron).**
- **Keep your distance from the radiation source as large as possible.**
- **Release radiation only if necessary.**
- **Set the radiation activity as low as possible. (low kV and mAs values)**
- **Release radiation for as short a time as possible.**
- **Checks during which radiation must be released are identified by the radiation warning symbol shown on the left.**

⚠ **DANGER**

When working on an open system there is danger of electric shock.

Disregarding this could result in death or injury.

Please note:

- ➪ **Approx. 300 DC V for the main inverter are present in the control console after switch off. The yellow LED is lit.**
- ➪ **- V26 on D920 with item number 45 65 396 or**
- ➪ **- V35 on D920 with item number 03 95 061.**
- ➪ **The voltage decreases within approx. 1.5 minutes to approx. 12 V; the LED goes out.**

- Connect the POLYMOBIL III only to a power supply (wall outlet) the installation of which corresponds to the requirements according to VDE 0107 or the national regulations.
- Prior to any intervention, switch the POLYMOBIL III off with the power **OFF** switch on the control console **and disconnect the power plug!**
- Install or remove boards only with the generator switched off under observation of the ESD guidelines.

1.6 Abbreviations

Abbrev.	Description
SI	Safety inspection
SIE	Electrical safety
SIM	Mechanical safety
PM	Preventive maintenance
PMP	Periodic preventive maintenance
PMA	Preventive maintenance adjustments
PMF	Preventive check of the operating values and functions
Q	System quality, image quality
QIQ	Image quality
QSQ	System quality
SW	Software maintenance

The steps identified by these abbreviations are part of the maintenance certificate and should be checked off upon completion.

NOTE

The sequence for complete maintenance and inspection is described on the following pages.

1.7 Protective conductor resistance test information

Observe the instructions in the "Safety Rules for Installation and Repair" (ARTD-002.731.17 ...).

The protective conductor resistance is to be measured, documented, and evaluated during maintenance.

NOTE

For evaluation purposes, the first measured value and the values documented during preceding maintenance procedures or safety checks are to be compared to the measured values. A sudden or unexpected increase in the measured values may indicate a defect in the protective conductor connections - even if the limit value of 0.2 Ohms is not exceeded. (protective conductor or contacts).

The measurement must be made according to DIN VDE 0751, Part 1 (see ARTD Part 2). In this case the protective conductor resistance for all conductive touchable parts must be measured during the normal operating state of the system.

Make sure that control cables or data cables between the components of the system do not imitate a protective conductor connection.

During the measurement, move the power cable and additional connection cables with an integrated protective conductor section by section to detect cable breaks.

The protective conductor resistance may not exceed 0.2 Ohms.

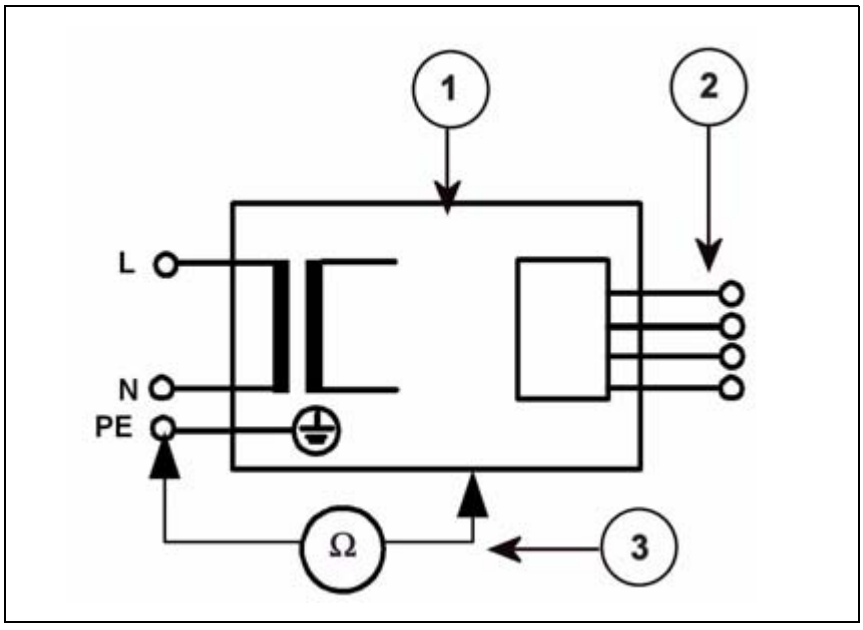

Fig. 2: Measuring circuit for measuring the protective conductor resistance for units that are disconnected from power, in compliance with DIN VDE 0751-1/2001-10, Fig. C2.

Pos. 1 = System

Pos. 2 = Application part type B (if available)

Pos. 3 = Measurement setup (integrated into measuring device)

The values determined must be recorded and assessed in the protective conductor resistance report and include the measured points.

The measuring procedure and the measuring instrument used (designation and serial number) are also to be documented.

NOTE

The protective conductor resistance report is filed in the "Certificates" register in the system binder.

NOTE

A new report must be created if the protective conductor resistance measurements are not documented.

A new protective conductor resistance report is included in start-up instructions RXB8-115.034.02.03. Separate this report from these instructions, fill it out, and file it in the "Certificates" register in the system binder. If values are newly determined, they are to be recorded as first measured values. The evaluation is omitted in this case.

1.8 Leakage current measurement information

NOTE

The leakage current measurement is to be conducted and recorded as the repeat measurement during maintenance.

However, the first measured value is to be newly determined and a new report is to be created under the following conditions:

- Lack of leakage current measurement documentation

- Deviation of the local line voltage from the line voltage documented in the report (e.g., location change/operator change)

- Use of a different procedure for measuring the leakage current than the one documented in the report.

For the purpose of traceability, reference to the new report is to be written on the old report. The reason for newly determining the first measured value is to document it and to confirm it with a name and signature.

Observe the instructions in the "Safety Rules for Installation and Repair" (ARTD-002.731.17 ...).

⚠WARNING

Electrical voltage!

Non-compliance can lead to severe injuries and even death.

➪ **The leakage current measurement may be performed on systems of protection class I only after the protective conductor test has been passed.**

First measured value

The first measured value has already been determined and documented in the leakage current report. The measuring procedure was also recorded.

The measurement was performed with the recorded line voltage and with the recorded measuring equipment.

Measurement

Perform the measurement according to DIN VDE 0751, Part 1 (see ARTD-002.731.17....), and record the determined value.

The measuring procedure indicated in the report is to be used.

If the first measured value has to be newly determined (see previous information), a measuring procedure can be selected (direct measurement or differential measurement).

Measurement of the leakage current according to the differential current method (measuring arrangement according to (Fig. 3 / p. 14)) must be given preference, since this method is not dangerous to the person performing the measurement and other persons.

However, please note the minimum resolution of the leakage current measuring instrument and any additional manufacturer's data restricting the use of the measuring instrument.

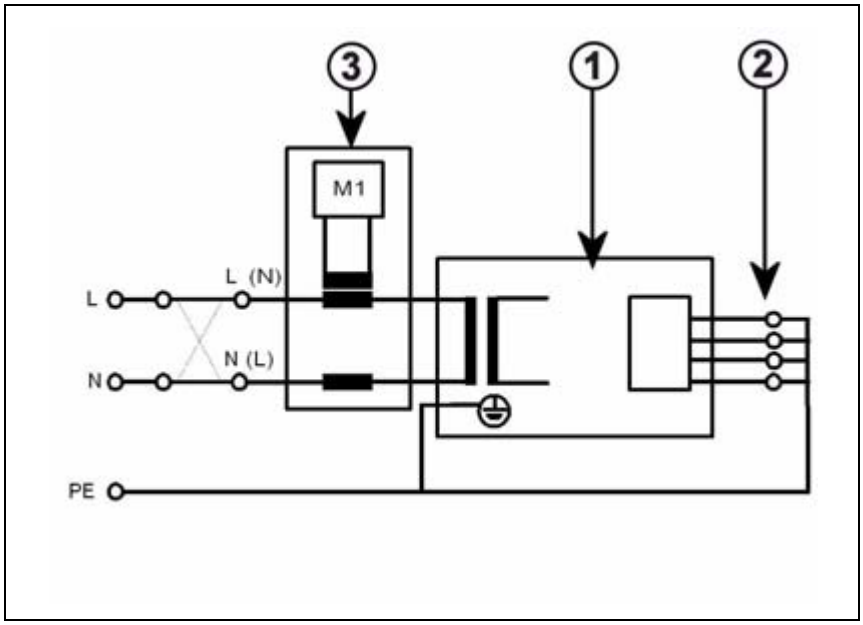

Fig. 3: Measuring circuit for measuring the leakage current according to the differential current method in compliance with DIN VDE 0751-1/2001-10, Fig. C6 for protection class I.

Pos. 1 = System

Pos. 2 = Application part type B (if available)

Pos. 3 = Measurement setup (integrated into measuring device)

If the direct measurement of the leakage current is used (measuring arrangement according to (Fig. 4 / p. 15)), the system must be set up to be insulated during the measurement and must not be touched.

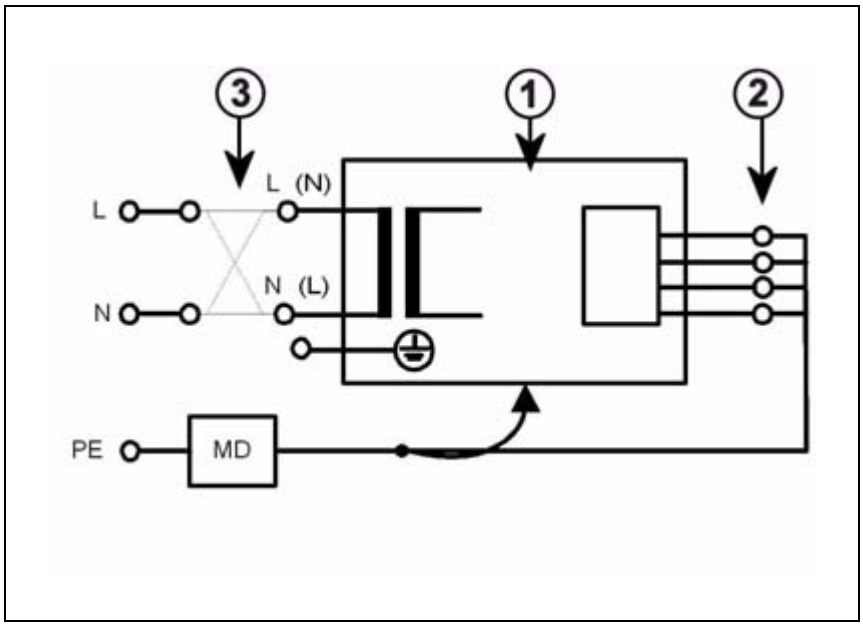

Fig. 4: Measuring circuit for direct measurement of the leakage current in compliance with DIN VDE 0751-1/2001-10, Fig. C5 for protection class I.

Pos. 1 = System

Pos. 2 = Application part type B (if available)

Pos. 3 = Measurement setup (integrated into measuring device)

⚠WARNING

Electrical voltage!

Non-compliance can lead to severe injuries and even death.

- ➪ **No housing parts of the system may be touched during direct measurement of the leakage current (measuring arrangement according to (Fig. 4 / p. 15)).**
- ➪ **Third-person access to the system must be prevented.**

The system must be switched on during measurement. Measuring instruments with automated measuring sequences must therefore be set to manual measurement.

The highest value is to be entered in the leakage current report .

This value must not exceed the permissible leakage current values according to DIN VDE 0751-1/2001-10, Table F.1, line "leakage current for devices according to remarks 1 and 3", of 2.5 mA.

Measure and record the current line voltage. If the measured line voltage deviates from the nominal voltage, correct the measured value to the value corresponding to a measurement at the nominal value of the line voltage. This is also to be documented.

Document the measuring procedure (differential measurement or direct measurement) and the measuring instrument used (designation and serial number).

In the case of repeat measurements, the measured value is also to be evaluated.

NOTE

For evaluation purposes, the first measured value and the values documented during preceding maintenance procedures or safety checks are to be compared to the measured values. A sudden or unexpected increase in the measured values may indicate that a fault has occurred in the primary circuit of the power supply (damaged insulation, damage caused by humidity, defective interference suppressor, etc.) - even if the limit value of 2.5 mA is not exceeded.

The evaluation is omitted in the case of a new determination.

File the leakage current report in the "Certificates" register in the system binder.

NOTE

The leakage current report is filed in the "Certificates " register in the system binder.

NOTE

A new report must be created if the leakage current measurements are not documented.

A new leakage current report is included in start-up instructions RXB8-115.034.02.03. Separate this report from these instructions, fill it out, and file it in the "Certificates" register in the system binder. If values are newly determined, they are to be recorded as first measured values. The evaluation is omitted in this case.

1.9 Technical Safety Checks (TSC)

Abbreviation: TSC = Technical Safety Checks

NOTE

Within the purview of DIN VDE 0751-1, the operator of medical engineering products has to perform technical safety checks at regular intervals.

The checks listed in these maintenance instructions include all technical safety checks required by DIN VDE 0751-1.

A separate report with print number SP00.000.834.01... is available for each technical safety check.

Within the purview of DIN VDE 0751-1, we recommend documenting the maintenance results both in the maintenance report and in the TSC report. The reports should be filled out completely and handed over to the client after maintenance is complete.

The table below assigns each technical safety check listed in document SP00.000.834.01... to the corresponding maintenance work.

Technical safety check certificate	Maintenance instructions, check/comments
1 Identification data	Please fill in the fields.
2 General checks	N/A
2.1 Visual inspection: Is there any damage affecting safety?	2.8.1 Check of system for damage, checks: SIM Covers SIM Switchbox/control console SIM Release cable SIM Power and primary cable SIM Electronic assemblies
2.2 Are all cables and cable guides secure and without any visible damage?	2.8.1 Check of system for damage, checks: SIM Release cable SIM Power and primary cable
2.3 Are undamaged accessories being used?	N/A
2.4 System radiation protection devices present and undamaged? (No on-site radiation shield)	2.10 Radiation, checks: SIE Radiation indicator SIE Acoustic signal

Technical safety check certificate	Maintenance instructions, check/comments
2.5 Are the required operator documents complete, present and legible?	2.8.3 Customer documentation, check: SI Customer documentation Ask the customer for additional required operator documents and check them for completeness, availability, and legibility.
2.6 Are all warning labels in place and recognizable?	2.8.2 Signs, check: SIM Signs
2.7 Are the operating symbols, light indicators and button labels OK?	2.10 Radiation, check: SIE Radiation indicator 2.11 Control console, checks: SIE Control elements SIE Displays
3. Electrical checks	N/A
3.1 Measurement of protective conductor resistance	2.12 Protective conductor test, check: SIE Protective conductor test
3.2 Leakage current or equivalent leakage current measurement	N/A
3.2.1 Leakage current measurement	2.13 Leakage current measurement, check: SIE Leakage current measurement
3.2.2 Equivalent leakage current measurement	N/A
3.3 Patient leakage current or equivalent patient leakage current measurement	N/A
3.3.1 Patient leakage current measurement	N/A
3.3.2 Equivalent patient leakage current measurement	N/A
4. Mechanical checks	N/A
4.1 Are all wall, ceiling and floor mountings secure and undamaged?	N/A

Technical safety check certificate	Maintenance instructions, check/comments
4.2 Are all mechanically moved system parts clean and running smoothly (lubricated, if required)?	2.5 Stand, check: SIM Support arm locking mechanism 2.6 Single tank, check: SIM Locking mechanism 2.7 Double-slot diaphragm, check: SIM Rotatability
4.3 Cables, chains, belts, and spindles without signs of wear?	2.5 Stand, check: SIM Chains of the spring counterbalance system
4.4 Mobile equipment: Are the wheels, rollers and brakes OK?	2.1 Screws, check: SIM Front wheels 2.3 Wheels, checks: SIM Noises SIM Freedom of motion SIM Wear of the rubber lining 2.4 Pedal positions, check: SIM brakes/locking
4.5 Is there any unusual noise during operation (e.g. gearing)?	2.3 Wheels, check: SIM Noises 2.5 Stand, check: SIM Spring counterbalance system
5. Functional checks	N/A
5.1 Function of the emergency-stop switch	N/A
5.2 Are the warning devices functioning properly?	2.10 Radiation, checks: SIE Radiation indicator SIE Acoustic signal
5.3. Do all system movements stop properly in their end positions?	N/A
5.4 Does the collision protection device stop all system movements properly (e.g. collision protection)?	N/A
5.5. Are all safety distances (wall, floor, ceiling) met or ensured by other appropriate measures (such as light barriers)?	N/A

Technical safety check certificate	Maintenance instructions, check/comments
5.6. Are the other safety shutdown devices functioning properly (e.g. safety floor plate)?	N/A
5.7 Are the positions of the table and system reproducible (e.g. zero positions, layer height, etc.)?	N/A
6. Product-specific checks	2.1 Screws, checks: SIM Cassette holder SIM Pedals 2.2. Handles, checks: SIM Single tank holder SIM Single tank SIM Control handle over the control console 2.4 Pedal positions, checks: SIM Maneuvering SIM Straight travel 2.5 Stand, check: SIM Stand mounting 2.6 Single tank, check: SIM Mounting
7. Test result/evaluation:	Evaluate the long-term trends of the protective conductor resistance and the leakage current by comparing the current measuring values to those of the preceding technical safety checks. A sudden or unexpected increase in the measured values may indicate a safety-related defect - even if the limit values are not exceeded. Enter the results of the check. Have the operator, or a person authorized by the operator, sign the TSC report. Hand the TSC report over to the operator, or a person authorized by the operator.

2 Inspection and Maintenance

2.1 Check screws

- Make sure that they are secure and tighten them if necessary:

SIM Cassette holder

SIM Pedals

SIM Front wheels

2.2 Check handles

- Make sure that the handles are secure and tighten them if necessary:

SIM **Single tank holder**

SIM **Single tank**

SIM **Control handle over the control console**

NOTE

If screws or securing elements are replaced, the screw locks must also be replaced.

2.3 Checking the wheels

SIM Noises

SIM Freedom of motion

SIM Wear of the rubber lining

- Check the wheels for noises, freedom of motion, and wear of the rubber lining and replace them if necessary (see the service instructions "Replacing the Steering Roller").

2.4 Checking the pedal positions

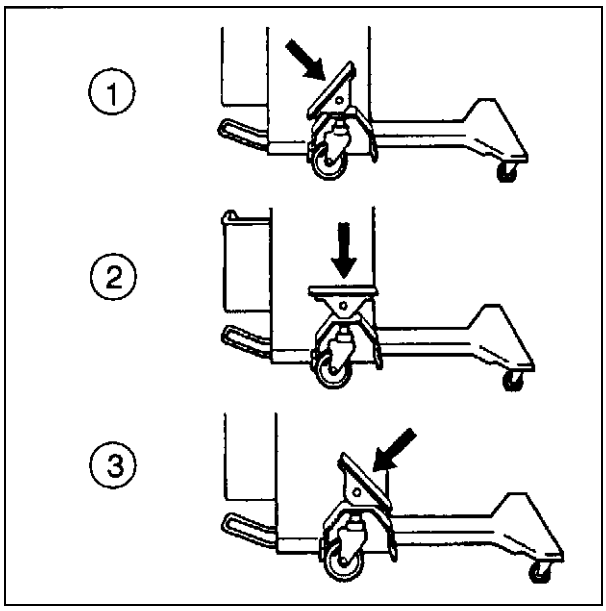

Fig. 1: Checking the pedal positions

- If the following functions are no longer guaranteed, completely replace both steering rollers (see the service instructions "Replacing the steering rollers").

SIM Brakes/locking

- Pedal positions as (1/Fig. 1 / p. 24)
  - ➪ The back wheels are blocked. The system is locked and can not be moved.

SIM Maneuvering

- Pedal positions as (2/Fig. 1 / p. 24)
  - ➪ The back wheels can be pivoted in any direction. The system can be pushed in any direction.

SIM Straight travel

- Pedal positions as (3/Fig. 1 / p. 24)
  - ➪ The system can be moved forward and backward. The front wheels are used for steering.

2.5 Stand

SIM Support arm locking mechanism

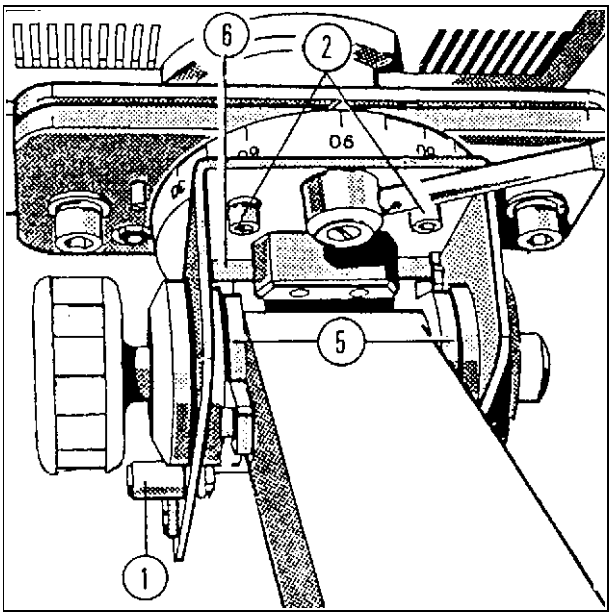

Fig. 2: Support arm locking mechanism

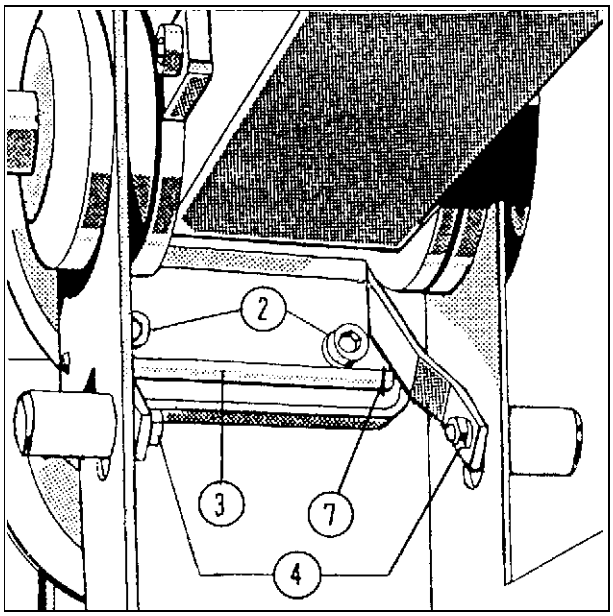

Fig. 3: Support arm locking mechanism

- Move the support arm into a horizontal position after releasing the locking mechanism (1/Fig. 2 / p. 25).
- Tighten the 4 Allen screws (2/Fig. 2 / p. 25) (2/Fig. 3 / p. 25).
- Move the arm system into the click-stop position. The central locking bolt must automatically move into the click-stop position without any frictional resistance.
- Check the axle (3/Fig. 3 / p. 25) for play and the locking rings (7/Fig. 3 / p. 25) for a secure fit.
- Check the nuts of the two grip bolts (4/Fig. 3 / p. 25) and tighten them if necessary.
- Check the edges of the locking disks (5/Fig. 2 / p. 25). They may not be worn.
- Ensure that there is play (without any friction) on all sides of the locking bar in the stand head (6/Fig. 2 / p. 25).

SIM Stand mounting

- Ensure that the stand is secure.

SIM Spring counterbalance system

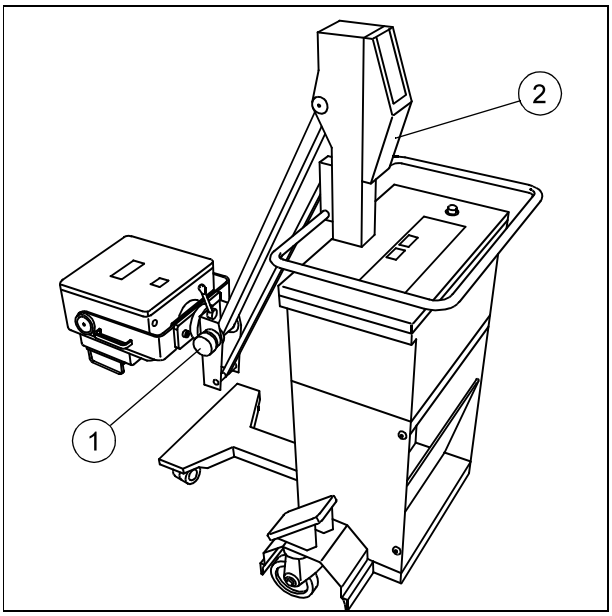

Fig. 4: Stand mounting

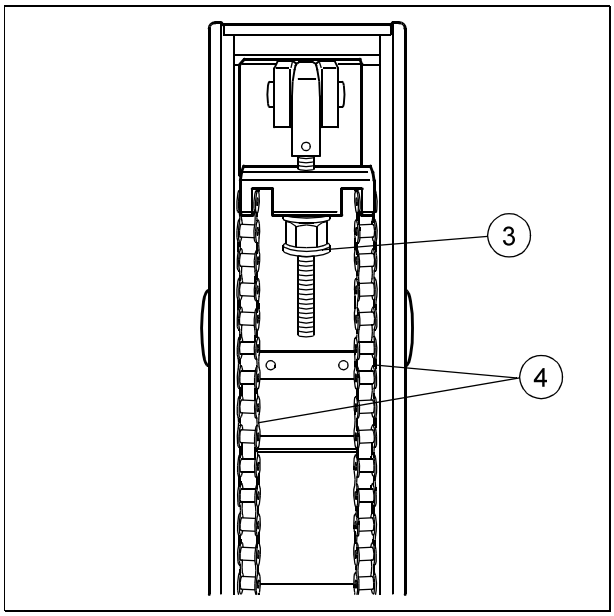

Fig. 5: Spring counterbalance system

- Release the support arm from the park position.
- Slowly move the support arm into the top position. The support arm must maintain any position without attached accessories and without an activated auxiliary brake (1/Fig. 4 / p. 26).
- Check the additional securing of the support arm via the rotary handle (1/Fig. 4 / p. 26).

Adjusting the spring tension:

- Remove the stand cover (2/Fig. 4 / p. 26).
- Completely release the support arm auxiliary brake (1/Fig. 4 / p. 26).
- Move the support arm into the horizontal position.
- Tighten the nut (3/Fig. 5 / p. 26) with a 17-mm fork wrench. Set the spring tension so that the support arm is in a state of equilibrium in a horizontal position, i.e., the forces for lifting and lowering the X-ray tube unit are equal.

SIM Chains of the spring counterbalance system

- Remove the stand cover (2/Fig. 4 / p. 26).
- Carefully check the state of the chains (4/Fig. 5 / p. 26) for the spring counterbalance system. Replace the stand column if the chains are defective.

PMP Maintenance of the joints and chains

- Spray the stand joints with multi-purpose WD-40 spray.
- Lubricate the chains (4/Fig. 5 / p. 26) with Optimol Longtime PD2 grease.
- Attach the stand cover (2/Fig. 4 / p. 26).

2.6 Single tank

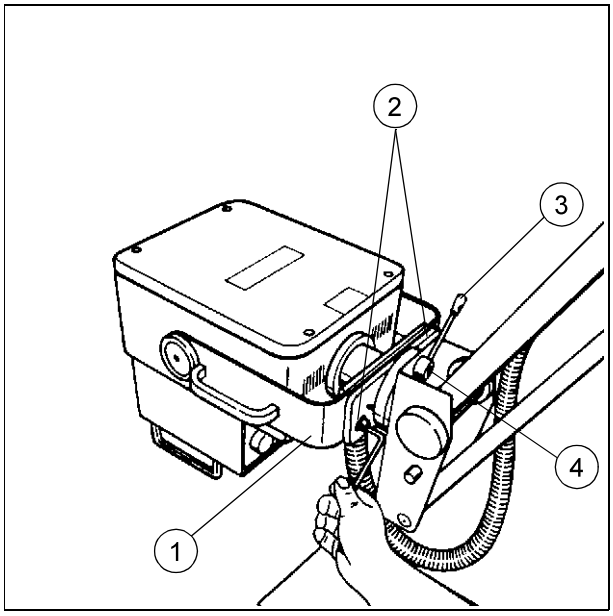

Fig. 6: Single tank

SIM Mounting

- The single tank holder (1/Fig. 6 / p. 27) including the single tank must fit securely on the flange of the support arm. The Allen screws (2/Fig. 6 / p. 27) must be tightened.

SIM Locking mechanism

- Ensure that the clamp handle (3/Fig. 6 / p. 27) is secure and tighten it if necessary.
- In an unlocked state (clamp handle (3/Fig. 6 / p. 27) to the left), the single tank can be easily moved to all sides.
- Check the locking mechanism:

  Tighten the clamp handle (3/Fig. 6 / p. 27) to the right. The single tank should no longer be able to be rotated.

  Adjusting the locking mechanism:

  - Tighten the clamp handle (3/Fig. 6 / p. 27) all the way to the right.
  - Remove the screw (4/Fig. 6 / p. 27) and use the screwdriver to press the clamp handle away from the axle.
  - Attach the clamp handle in the vertical position and tighten the screw (4/Fig. 6 / p. 27).
  - Recheck the locking mechanism of the single tank.

2.7 Double-slot diaphragm

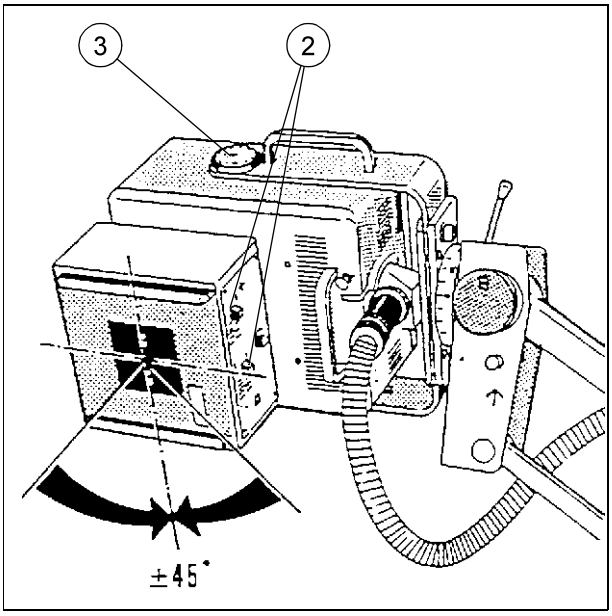

Fig. 7: Double-slot diaphragm 18 04 470

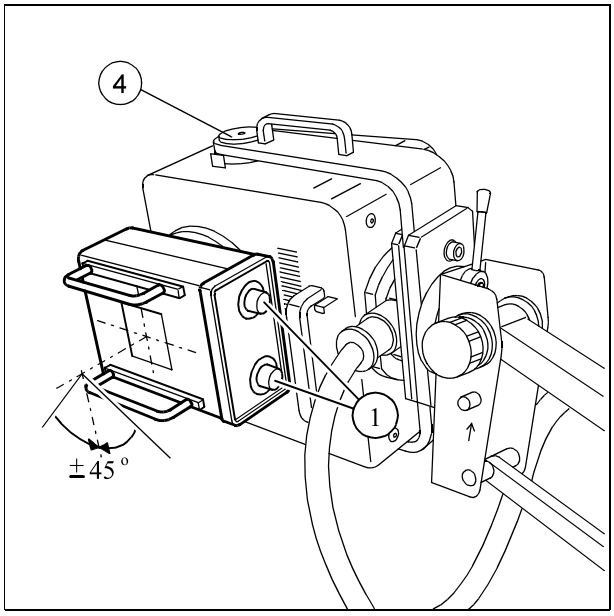

Fig. 8: Double-slot diaphragm 18 13 190

- Connect the power plug, POLYMOBIL **ON**.

PMF Light localizer lamp

- Check the light localizer lamp for proper functioning and replace it if necessary.

SIM Rotatability

- Check the double-slot diaphragm for smooth rotatability of ± 45°.

PMF Format setting

- Check the smoothness and uniformity of the format setting (collimator plate pairs) by turning or shifting the collimator handles (2/Fig. 7 / p. 28) and (1/Fig. 8 / p. 28)

PMF 0° setting

- Move the support arm to the top position.
- Place a level on the double-slot diaphragm to check the 0° setting. If necessary, adjust the scale after loosening the screw (3/Fig. 7 / p. 28) and (4/Fig. 8 / p. 28) on both sides.
- POLYMOBIL **OFF** and disconnect the power plug.

2.8 Visual inspection

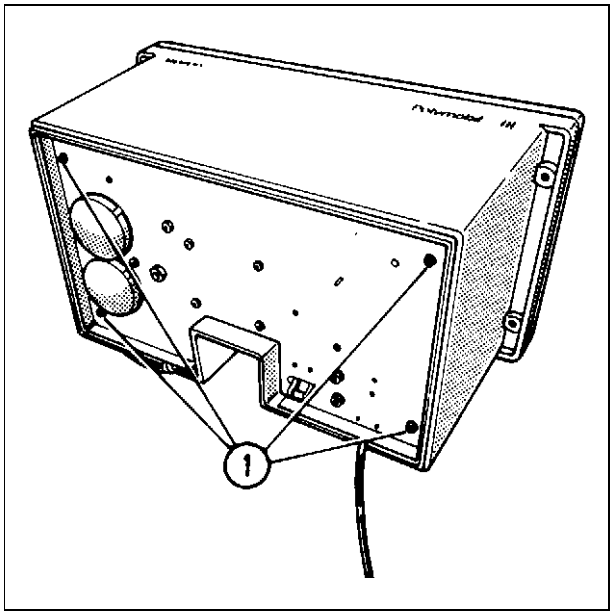

Fig. 9: Switchbox/control console

2.8.1 Check the system for damage.

- If necessary, repair or replace damaged parts.

SIM Covers

SIM Switchbox/control console

SIM Release cable

Check the rolling mechanism of the cable drum.

SIM Power and primary cable

- For the checks, open the control console as follows:
  - Lock the foot brake.
  - Unscrew the hand screw and the protective conductor cable shoe on the bottom of the control console (accessible via the cassette holder).

NOTE

Do not lose the two toothed washers for the protective conductor cable!

  - Disconnect the brackets from the grooved hose.
  - Use the handle recesses to lift the control console and set it down on a table or similar base.
  - Remove the 4 Allen screws (1/Fig. 9 / p. 29) and lift the cover.
- Examine the lines for damage and brittleness. Pay particular attention to the cable path at the turns in the grooved hose.
  - Ensure that the holder is secure at points where the lines are subject to particular stress due to movement.

SIM Electronic assemblies

- Ensure that the assemblies, boards, and components are secure and check for damage.

2.8.2 Signs

SIM Signs

- Check all signs on the system with the model and serial numbers as well as warnings. The placement of these signs is described in the operating instructions ("Positioning the Information Signs" chapter).
- Verify that all signs are present and legible.

2.8.3 Customer documentation

SI Customer documentation

- The operating instructions must be available at the customer site.

  The operating instructions are to be checked for availability, completeness, and legibility.

2.9 Checking the voltage supplies

- Connect the power plug, POLYMOBIL **ON**.

2.9.1 Board D920

PMF Voltage supplies, board D920

2.9.1.1 Board D920, item no.: 45 65 396

Upon switch-on, tighten relays HR and K2 on D920 and supply transformer T1, power supply unit M6, and the intermediate circuit with line voltage.

- Use the DVM to measure the 24 V voltage supply at “+24 V” und “0 V” on D920.
  - ➪ Measured voltage approx. 28.2 V (± 5 volts).
- Measure the filament circuit voltage supply on D920 at electrolytic condenser C3 (top, right of the board).
  - ➪ Measured voltage:
    - In stand-by mode approx. 18.5 V (± 4 V)
    - During preparation approx. 16.4 V (± 3 V)

2.9.1.2 Board D920, item no.: 03 95 061

Upon switch-on, tighten relays HR and K2 on D920 and supply transformer T1, power supply unit M6, and the intermediate circuit with line voltage.

- Use the DVM to measure the 24 V voltage supply at “+24 V” und “0 V” on D920.
  - ➪ Measured voltage approx. 28.2 V (± 5 volts).
- Measure the filament circuit voltage supply on D920 at electrolytic condenser C46 (top, right of the board).
  - ➪ Measured voltage:
    - In stand-by mode approx. 18.5 V (± 4 V)
    - During preparation approx. 16.4 V (± 3 V)

2.9.2 Board D910

PMF Voltage supplies, board D910

- Measure the voltage supplies at D910.X3 (top, right on the board).
  - ➪ +5 V at X3.4 and X3.1 (0 V) (tolerance: ±0.5 V for item no. 03 95 442; ±0.2 V for item no. 45 65 214).
  - ➪ +15 V at X3.5 and X3.6 (0 V) (tolerance: ±1 V).
  - ➪ -15 V at X3.7 and X3.6 (0 V) (tolerance: ±1 V).
- POLYMOBIL **OFF** and disconnect the power plug.

2.10 Radiation

- Close the double-slot diaphragm.

PMF kV and tube current (IR)

- Connect the oscilloscope on D910 to MP "kV" (1 V equals 10 kV actual value) "IR" (ACTUAL) and "GROUND".
- Connect the power plug, POLYMOBIL **ON**.
- Trigger exposure with preferred data 60 kV, 10 mAs.

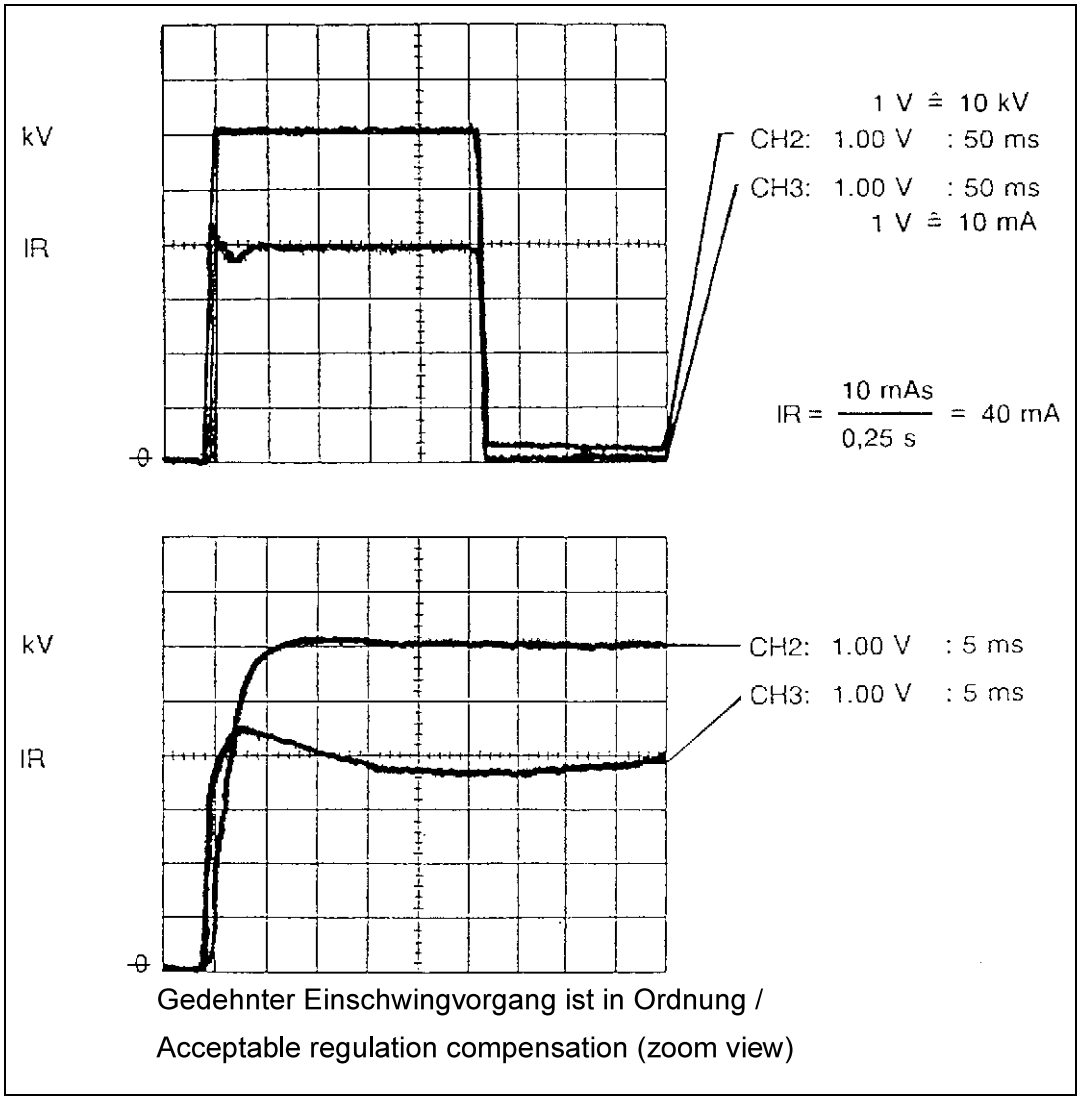
kV
IR
1 V ≙ 10 kV
CH2: 1.00 V : 50 ms
CH3: 1.00 V : 50 ms
1 V ≙ 10 mA
IR = 10 mAs / 0,25 s = 40 mA
kV
IR
CH2: 1.00 V : 5 ms
CH3: 1.00 V : 5 ms
Gedehnter Einschwingvorgang ist in Ordnung /
Acceptable regulation compensation (zoom view)

Fig. 10: kV and tube current

- Connect the oscilloscope on D910 to MP "IRS" (TARGET), "IR" (ACTUAL) and "GROUND".

- Trigger exposure with preferred data 60 kV, 10 mAs.

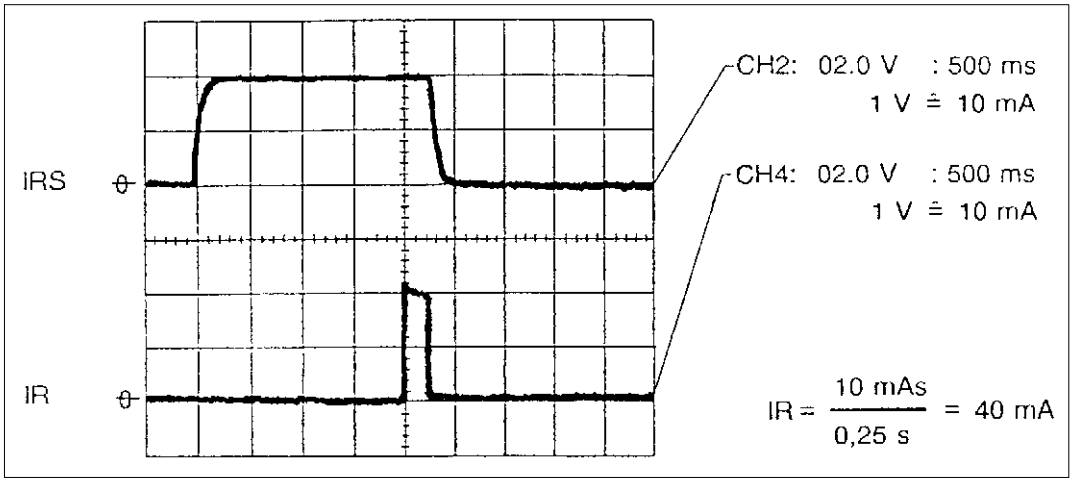

Fig. 11: Tube current

- If the oscillograms are not produced, perform an adjustment according to the service instructions.
- POLYMOBIL **OFF** and disconnect the power plug.
- Then close the control console, set it on the mobile stand, fasten it with the hand screw and connect the protective conductor cable shoe.

SIE Radiation indicator

SIE Acoustic signal

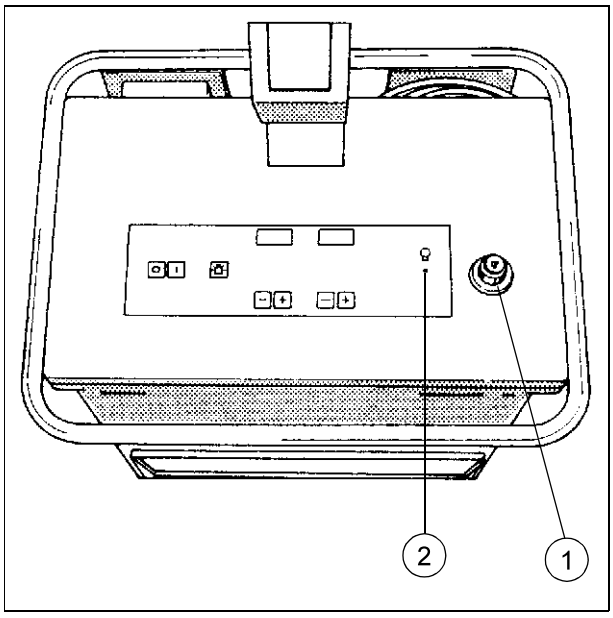

Fig. 12: Radiation indicator

- Connect the power plug, POLYMOBIL **ON**.
- Completely disconnect the release cable (1/Fig. 12 / p. 33).
- Trigger exposure with preferred data 60 kV, 10 mAs.

  ➪ The radiation indicator (2/Fig. 12 / p. 33) must be lit during an exposure. An acoustic signal sounds at the same time.

QSQ Coincidence of the light field and radiation field

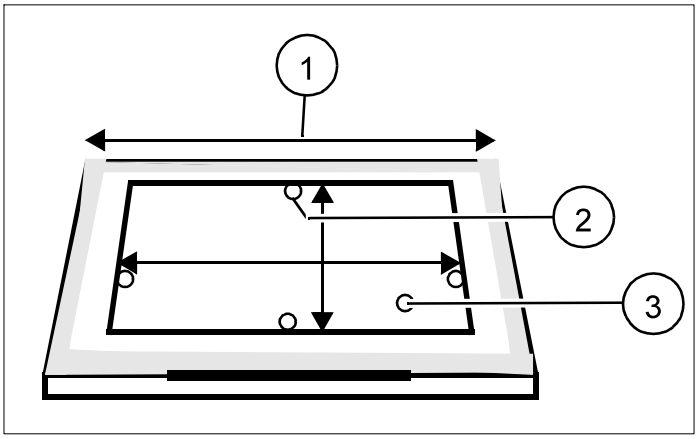

Fig. 13: Preparation: light field and radiation field

Pos. 1 Length

Pos. 2 Marker

Pos. 3 Side marker

Work sequence:

- Load a 24 cm x 30 cm or 10" x 12" cassette with film and place it on a table or similar support.
- Use a tape measure to set a vertical SID of 100 cm or 40" to the top edge of the cassette.
- Set a format of 18 cm x 24 cm or 8" x 10" via the knobs.
- Switch the light localizer on and align the cassette.
- Place a radio-opaque marker (e.g. washer, coin) on the cassette as shown in the diagram. Position a washer as a side marker.

- Release exposure (60 kV, 10 mAs) and process the film.
- Make a note on the processed film of the following data using a waterproof felt tip pen:
  - Adjusted SID
  - Film size
  - Radiation field size

Evaluation:

- Measure the deviations (X1, X2, Y1, Y2) between the edges of the light field and the edges of the radiation field on all four sides as shown in the diagram.

- Calculate the overall difference in the X and Y directions (without regarding the mathematical sign in front).

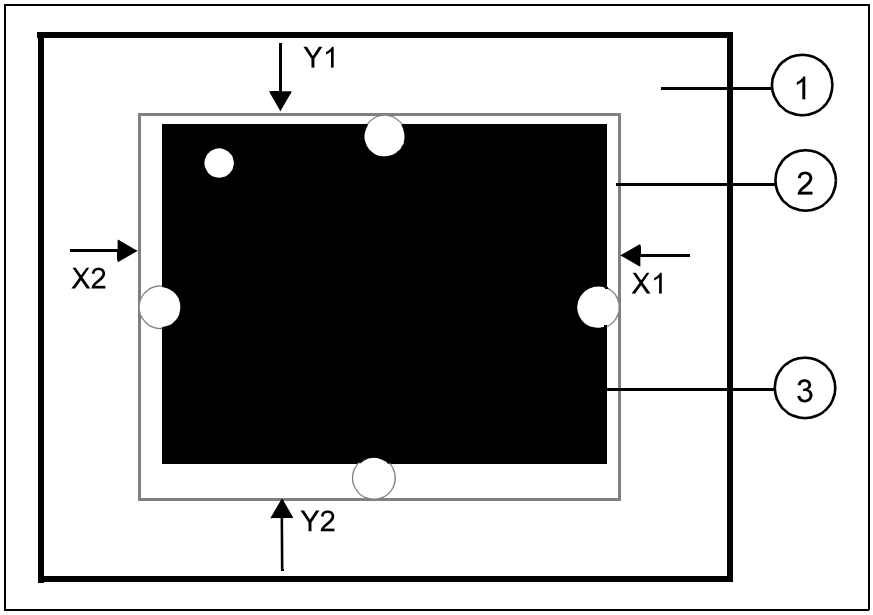

Fig. 14: Evaluation of the light field and radiation field

Pos. 1 Film

Pos. 2 Light field

Pos. 3 Radiation field

Collimator with item no. 18 04 470:

➪ The length deviation (∑Y) as well as the width deviation (∑X) must be less than 1.2 cm in each case.

NOTE

The collimator is set at the factory and cannot be readjusted.

In the case of deviations greater than 1.2 cm, the collimator must be completely replaced.

Collimator with item no. 18 13 190:

➪ The length deviation (∑Y) as well as the width deviation (∑X) must be less than 1.6 cm in each case.

NOTE

In the case of deviations greater than 1.6 cm, see the "Coincidence of the Light Field and Radiation Field" chapter of the service instructions.

2.11 Control console

SIE Operating elements

SIE Displays

- Check the operating elements and displays on the control console.
  - See "Overview of the Operating Elements" in the operating instructions.
- POLYMOBIL **OFF** and disconnect the power plug.

2.12 Protective conductor test

SIE Protective conductor test

Observe the protective conductor resistance test information in these instructions.

- The protective conductor test is to be performed on a closed system according to ARTD-002.731.17...

  The protective conductor resistance may not exceed 0.2 Ohms.
- The values determined must be recorded and assessed in the protective conductor resistance report and include the measured points.
- The measuring procedure and the measuring instrument used (designation and serial number) are also to be documented.

NOTE

The protective conductor resistance report is filed in the "Certificates" register in the system binder.

NOTE

A new report must be created if the protective conductor resistance measurements are not documented.

A new protective conductor resistance report is included in start-up instructions RXB8-115.034.02.03. Separate this report from these instructions, fill it out, and file it in the "Certificates" register in the system binder. If values are newly determined, they are to be recorded as first measured values. The evaluation is omitted in this case.

2.13 Leakage current measurement

SIE Leakage current measurement

Observe the leakage current measurement information in these instructions.

- The leakage current is to be measured when the system is closed according to ARTD-002.731.17...

  The measuring procedure indicated in the report is to be used. If the first measured value has to be newly determined, a measuring procedure can be selected (direct measurement or differential measurement).

  The limit value of 2.5 mA may not be exceeded.
- Document the measuring procedure (differential measurement or direct measurement) and the measuring instrument used (designation and serial number).
- Measure and record the current line voltage. If the measured line voltage deviates from the nominal voltage, correct the measured value to the value corresponding to a measurement at the nominal value of the line voltage. This is also to be documented.
- The highest value is to be entered in the leakage current report and evaluated.

NOTE

The leakage current report is filed in the "Certificates" register in the system binder.

NOTE

A new report must be created if the leakage current measurements are not documented.

A new leakage current report is included in start-up instructions RXB8-115.034.02.03. Separate this report from these instructions, fill it out, and file it in the "Certificates" register in the system binder. If values are newly determined, they are to be recorded as first measured values. The evaluation is omitted in this case.

2.14 Final work steps

PMP Cleaning

Prior to cleaning or disinfecting, switch the POLYMOBIL off and disconnect it from the power supply.

Rub the POLYMOBIL with a moist cloth or cotton pad. Use water or a lukewarm, diluted, watery household cleaning solution.

Do not use scouring cleaning agents or organic solvents or solvent-based cleaning agents (for example, benzine, alcohol, spot remover) because of potential incompatibility with the material!

Do not spray the POLYMOBIL! Never let cleaning agents get into the POLYMOBIL!

3 Changes to Previous Version

Chapter	Section	Revision
All	N/A	Documents converted to DMS and revised
General information	Required documents	Technical safety check report added
General information	Protective conductor resistance test information	New section
General information	Leakage current measurement information	New section
General information	Technical safety checks	New section
Inspection and maintenance	N/A	Various checks classified as 'important for safety', i.e., the appropriate checkpoints were changed to SIE or SIM
Inspection and maintenance	Visual inspection of the signs	New section
Inspection and maintenance	Visual inspection of customer documentation	New section
Inspection and maintenance	Protective conductor test	Completely rewritten
Inspection and maintenance	Leakage current measurement	Completely rewritten
Inspection and maintenance	Final work steps	"Disinfection" checkpoint deleted